

# Being Cloud Native, not Cloud Naive

## CNAE – Cloud Native Architecture & Engineering



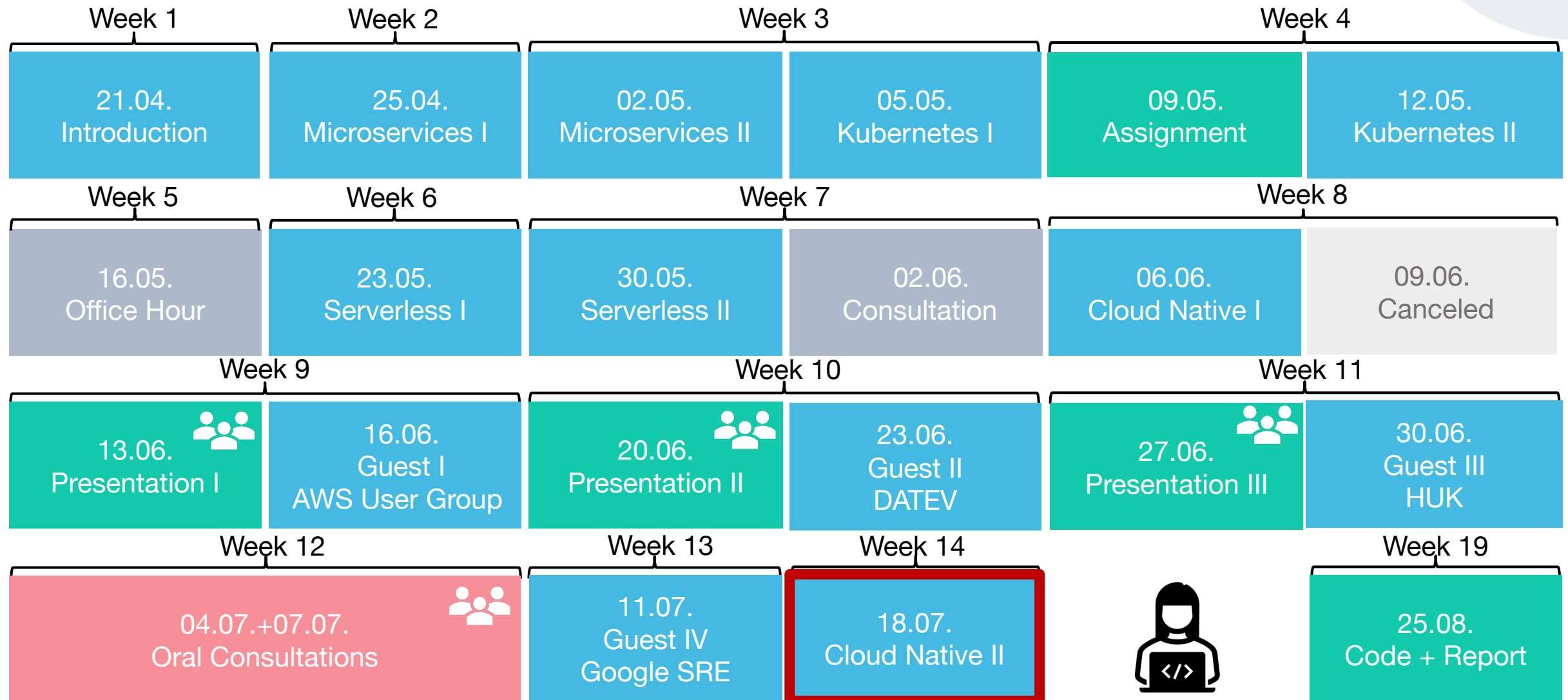
**Prof. Stefan Tai**

Sebastian Werner, Elias Grünewald, Nicola Leschke, Maria Borges

Information Systems Engineering

TU Berlin

# Schedule





## 37 Things One Architect Knows About IT Transformation

A Chief Architect's Journey

Gregor Hohpe

*Following, let's have a look at some arbitrarily selected quotes from the not so arbitrarily composed book.*

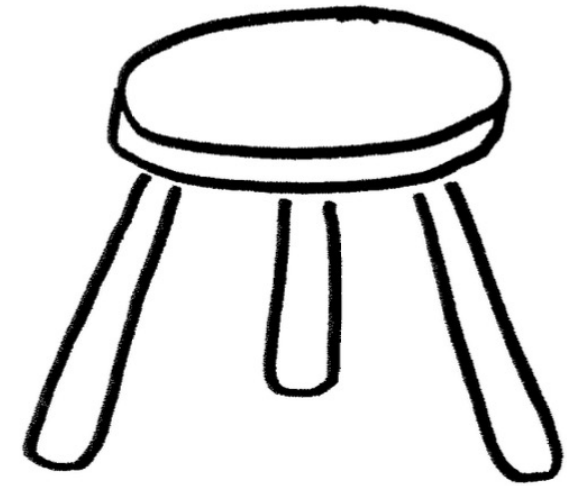
## [Architects]

### #5. An Architect Stands on Three Legs

“IT architects are the people who make IT architecture.

A successful architect has to stand on three legs.”

1. **Skill** – the foundation. Requires knowledge and the ability to apply the knowledge.
2. **Impact** – how well is skill applied in projects for the benefit of a project or a company?  
Rational and disciplined decision-making translates skills into impact.
3. **Leadership** – assures that the state of practice advances and more architects are grown.



Source: Gregor Hohpe, “37 Things One Architect Knows About IT Transformation”

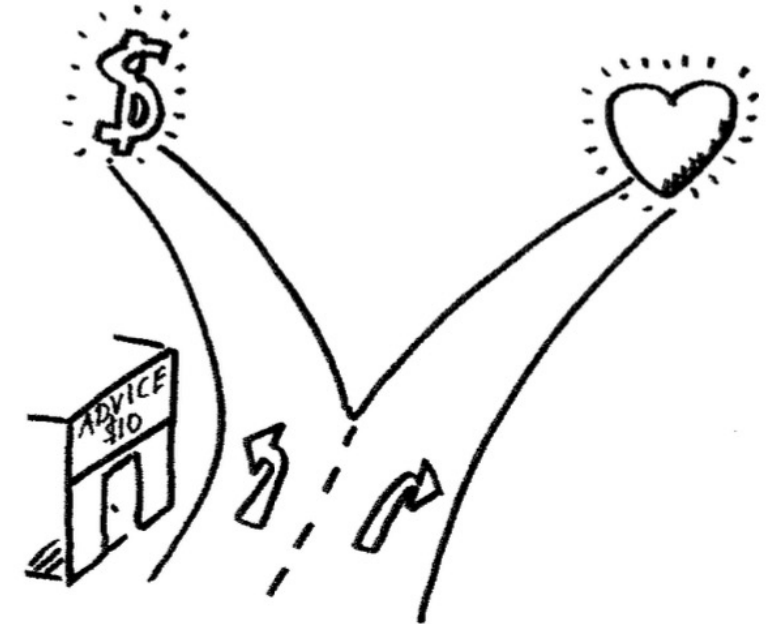
# [Architects]

## #6. Making Decisions

“Making decisions is a key aspect of an enterprise-scale architect’s job.

So, in order to be a good architect, you likely need to make a conscious effort to become a better decision-maker.”

- Have math involved in decision-making: go beyond the popular “traffic light” comparison tables, use rigid metrics, overcome confirmation (and other) bias
- Model thinking. “All models are wrong, but some are useful.”



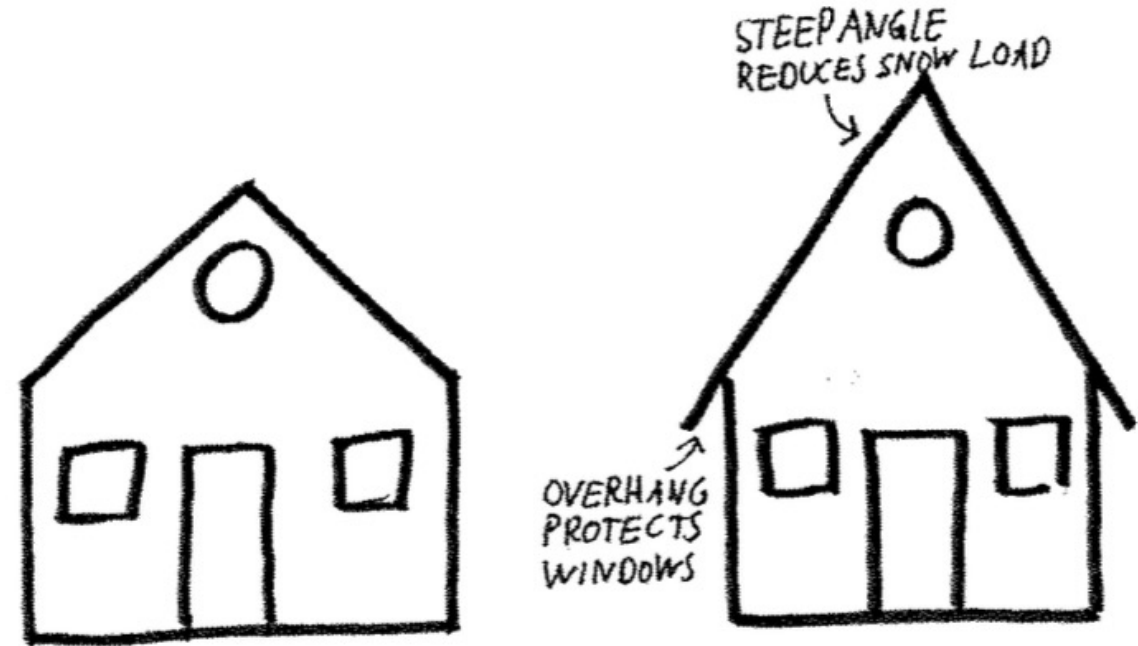
Source: Gregor Hohpe, “37 Things One Architect Knows About IT Transformation”



# [Architecture]

## #9. Is this Architecture?

Look for decisions!



Source: Gregor Hohpe, "37 Things One Architect Knows About IT Transformation"

# [Architecture]

## #12. If You Never Kill Anything, You Will Live Among Zombies

“Systems become legacy zombies by not evolving with the technology.”

- The key driver for managed evolution is to maintain agility in a system (a system that no one wants to touch has no agility – it can't be changed).
- Run versus change. Think DevOps.
- Without proper instrumentation and automation, making changes is not only scary but indeed risky.  
But: “If it hurts, do it more often” – deferring a painful task generally makes it disproportionately more painful



Source: Gregor Hohpe, “37 Things One Architect Knows About IT Transformation”

# [Communication]

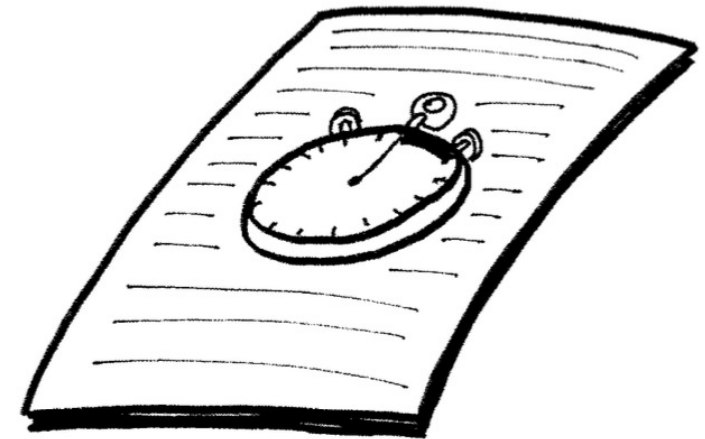
## #17. Writing for Busy People / #21. Diagram-Driven Design

“Don’t expect everyone to read word-by-word.”

“In der Kürze liegt die Würze!”

“Cheating in a picture is much harder than cheating in words.”

- Story-telling headings can replace executive summaries.
- Use Callouts to indicate additional detail.
- Diagrams provide a visual anchor for important sections.
- Establish a visual vocabulary and viewpoints.



Source: Gregor Hohpe, “37 Things One Architect Knows About IT Transformation”

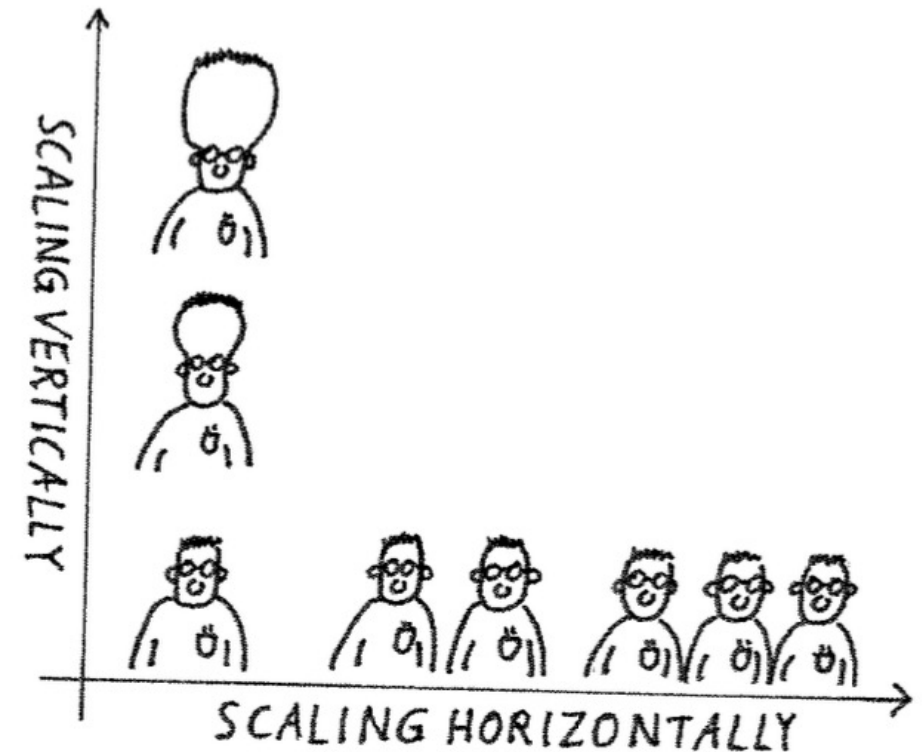


# [Organization]

## #26. Scaling an Organization

“How to scale an Organization?  
The same way you scale a system!”

1. Component Design – Personal Productivity
2. Avoid Sync Points – Meetings Don’t Scale
3. Interrupts Interrupt – Phone Calls
4. Piling Instead of Backing Off
5. Asynchronous Communication – Email, Chat, and More
6. Asking Doesn’t Scale – Build a Cache!
7. Poorly Set Domain Boundaries – Excessive Alignment
8. Self-Service is Better Service
9. Staying Human



Source: Gregor Hohpe, “37 Things One Architect Knows About IT Transformation”

## [Transformation]

### #32. Who Likes Standing in Line?

“Good Things Don’t Come to Those Who Wait.”

- Looking between the activities, not at the activities
- Queuing Theory, Little’s result:  $N = \lambda T$ ,  
or  $T = N/\lambda$ 
  - Finding queues in an organization:  
busy calendars, steering meetings, email  
inboxes
  - Processes optimized for control and utilization,  
but not for speed
- Cutting the line!
- Making queues visible!



Source: Gregor Hohpe, “37 Things One Architect Knows About IT Transformation”

You probably know more than 37 Things about  
[Cloud-Native] Architecture and Engineering by  
now...

...and feel *skilled* and *encouraged* to take an  
*active (leadership) role* to have an *impact* on  
projects that matter...



## 37 Things One Architect Knows About IT Transformation

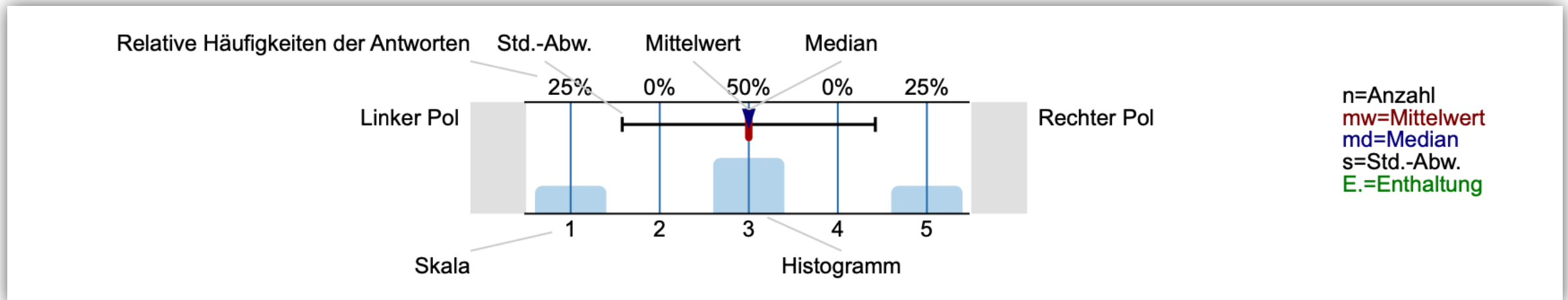
A Chief Architect's Journey

Gregor Hohpe

# Teaching evaluation (Lehrevaluation)

General information about the teaching evaluation (Lehrevaluation) at EECS:

<https://www.tu.berlin/eecs/studium-lehre/qualitaet-in-studium-lehre/lehrevaluation>



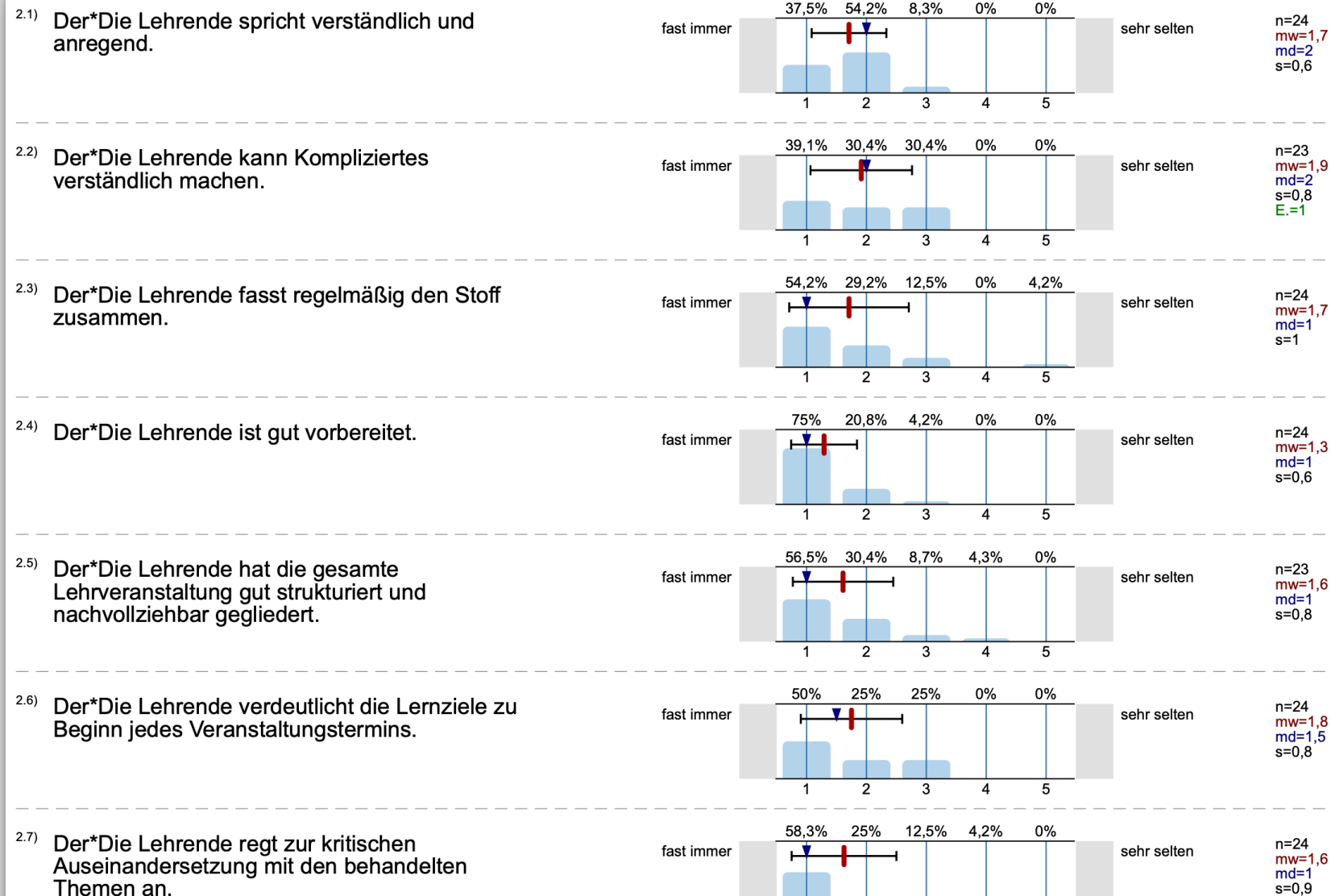
*Q: The instructors  
are doing xyz ...*

*Always*



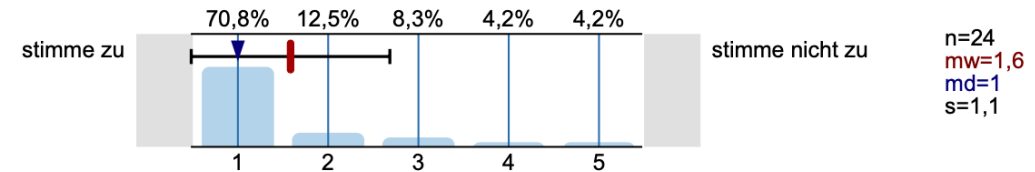
*Never*

# Didactic preparation by the instructors

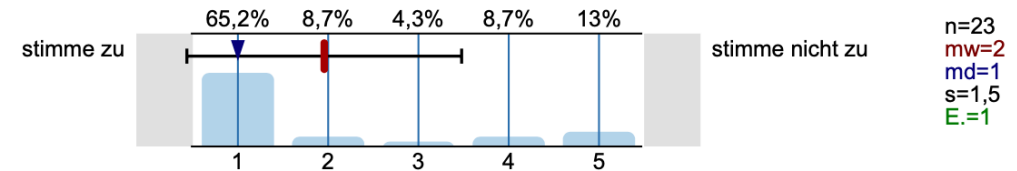




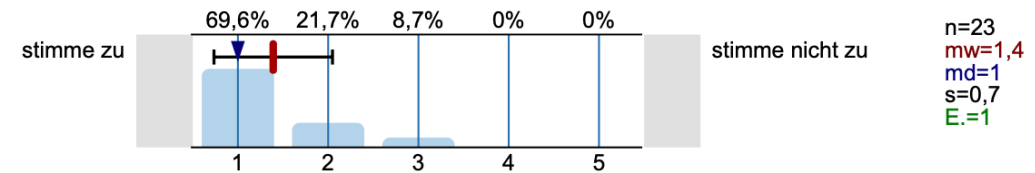
3.1) In dieser Lehrveranstaltung wird auf Anfragen schnell reagiert.



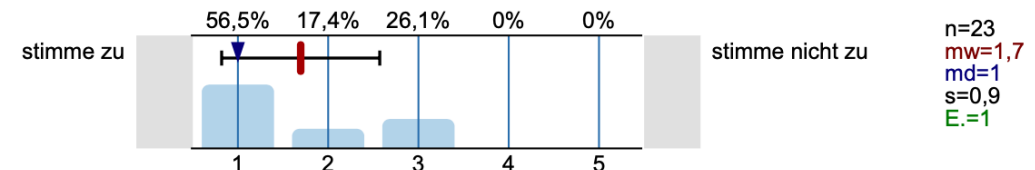
3.2) In dieser Lehrveranstaltung werden organisatorische Anfragen sehr gut beantwortet.



3.3) In der Lehrveranstaltung werden fachlich-inhaltliche Anfragen sehr gut beantwortet.



3.4) Insgesamt betrachtet ist die Betreuung in der Lehrveranstaltung sehr gut.

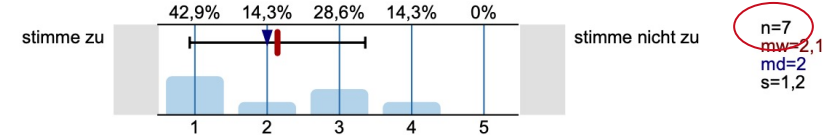




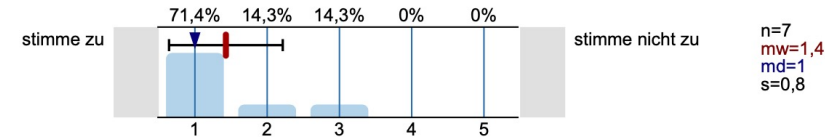
# Assignments & group work



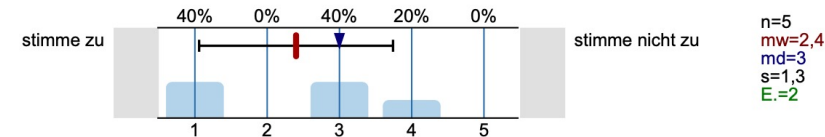
4.2) Die vorgegebenen Aufgabenstellungen sind verständlich formuliert.



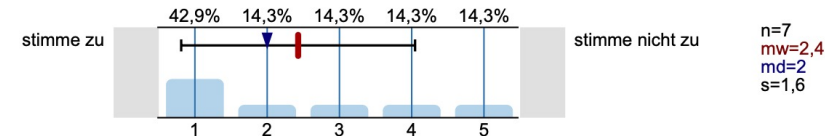
4.3) Die Aufgaben können selbstständig durchgeführt werden.



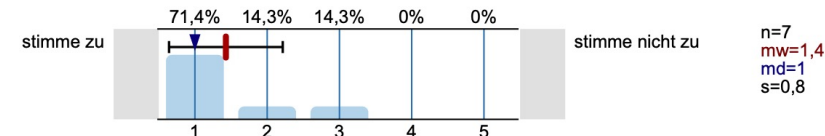
4.4) Die Ergebnisse der Aufgaben werden von dem\* der Lehrenden ausreichend nachbereitet.



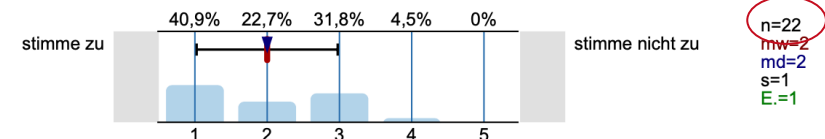
4.5) Es werden ausreichend Hilfestellungen für das Lösen der Aufgaben bereitgestellt.



4.6) Die gestellten Aufgaben sind hilfreich, um den vermittelten Stoff besser zu verstehen.



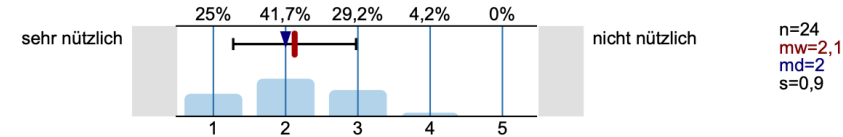
5.6) Insgesamt betrachtet ist die Umsetzung der Gruppenarbeit sehr gut gelungen.



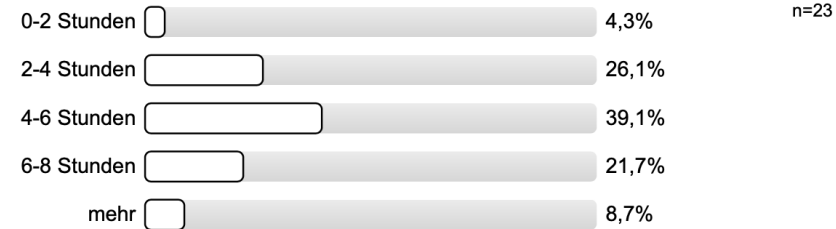
# Overall evaluation



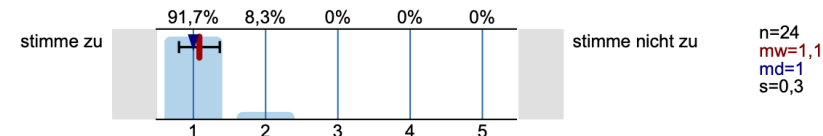
8.1) Insgesamt gesehen sind die bereitgestellten Lernmaterialien (z.B. Skripte, Literatur, Audio oder Video) für meinen Lernerfolg...



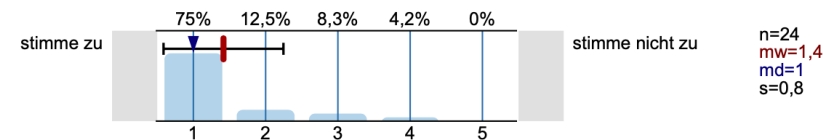
8.3) Wie viele Stunden pro Woche benötigen Sie durchschnittlich zur Vor- und Nachbereitung dieser Lehrveranstaltung?



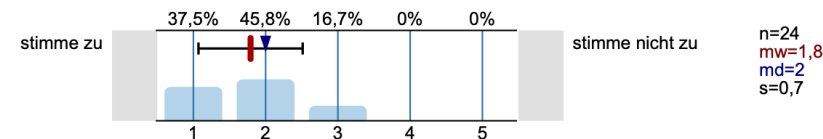
8.4) In der Lehrveranstaltung herrscht ein diskriminierungsfreier und respektvoller Umgang zwischen dem\*der Lehrenden und den Studierenden.



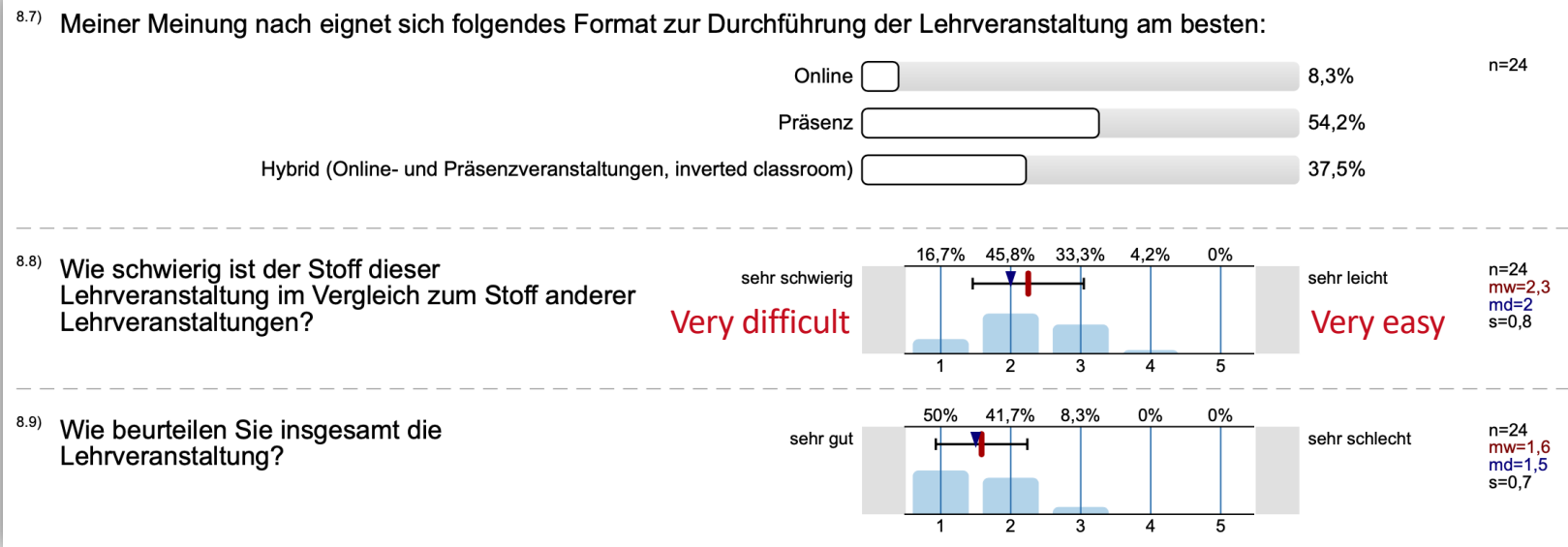
8.5) In der Lehrveranstaltung herrscht ein diskriminierungsfreier und respektvoller Umgang zwischen den Studierenden.



8.6) Ich habe die gelehrtten Inhalte dieser Lehrveranstaltung sehr gut verstanden.



# Overall evaluation (contd.)



(Difficulty/Complexity)

## Comments

“Everything is perfect”, “Everything is okay”, “Guest lectures are a big plus!” ...  
=> Thank you!

## Assignments and Organization

- “The task/**assignment is not clearly defined**”
- ”I think it might be better to **merge** for example **the presentation and the oral consultation** into one and extending the time for the presentation such that everyone can participate. Another option could be to **leave the design document out** and just have an extended presentation which allows for more room to present for example approaches from literature in more depth.”
- ”I would like to see the **selected projects prepared a bit more** next time. Currently we have to invest a lot of time to build up our baseline and our test environment. Even though it is part of it to experience and try out these things myself, I still find it a pity.”

## Comments (contd.)

“The office hour we had as a group was only 15 minutes, which is not enough. Either make 2 **office hours** per group, or one that lasts longer. There was also not enough input from your side about the topics and what is exactly from us expected“

## Workload

- “All in all, I think it wouldn't hurt to reduce the workload somewhat and the course would still be worth of **6 ECTS**.”
- “Overall, a bit much for **6lp**. One exam element less would have done. Possibly without the oral consultation”
- “please keep in mind that this is a **6LP** course, with 2 lectures per week, oral examination and a lot of group work within the semester.”
- “The module is very demanding with 5 portfolio parts, and it should be possible to get credit for 9 LP rather than **6 LP** to justify the effort.”
- “The effort of this module exceeds **6 ECTS** compared to all other modules I have ever done”

## Comments (contd.)

### Practical experience

- “Practical part of the course should be like Stanford’s [software engineering course]”
- “the topics should be more in details with example. For instance for the microservices design pattern part.”
- “Although there are already quite a lot of examples in the lectures which is really helpful, I was missing them a bit in the Microservice lectures.”
- “To me, this class was really good since I don't have any experience with Kubernetes or cloud technologies from previously, and the reading assignment and presentation forced me to read about all sorts of things and research related topics, which means I now feel like I have a good overview.”

*...and many more comments. Thank you!*



# Feedback

In case you have something, please feel free to give us feedback (you may use the anonymous feedback tool in ISIS – which now finally works...)

<https://isis.tu-berlin.de/mod/feedback/view.php?id=1533645&courseid=32802>



Anonymous Feedback



Nicht verfügbar, es sei denn: Sie sind in **Zugelassen**

## Last Remarks

## Upcoming Deadlines

**Programming** and the **Final Report** are due on **25.08.2023 at 23:59**.

### **Programming:**

- Implement and measure your refactoring approach in realistic environments.
- Hand in as zipped Git repo

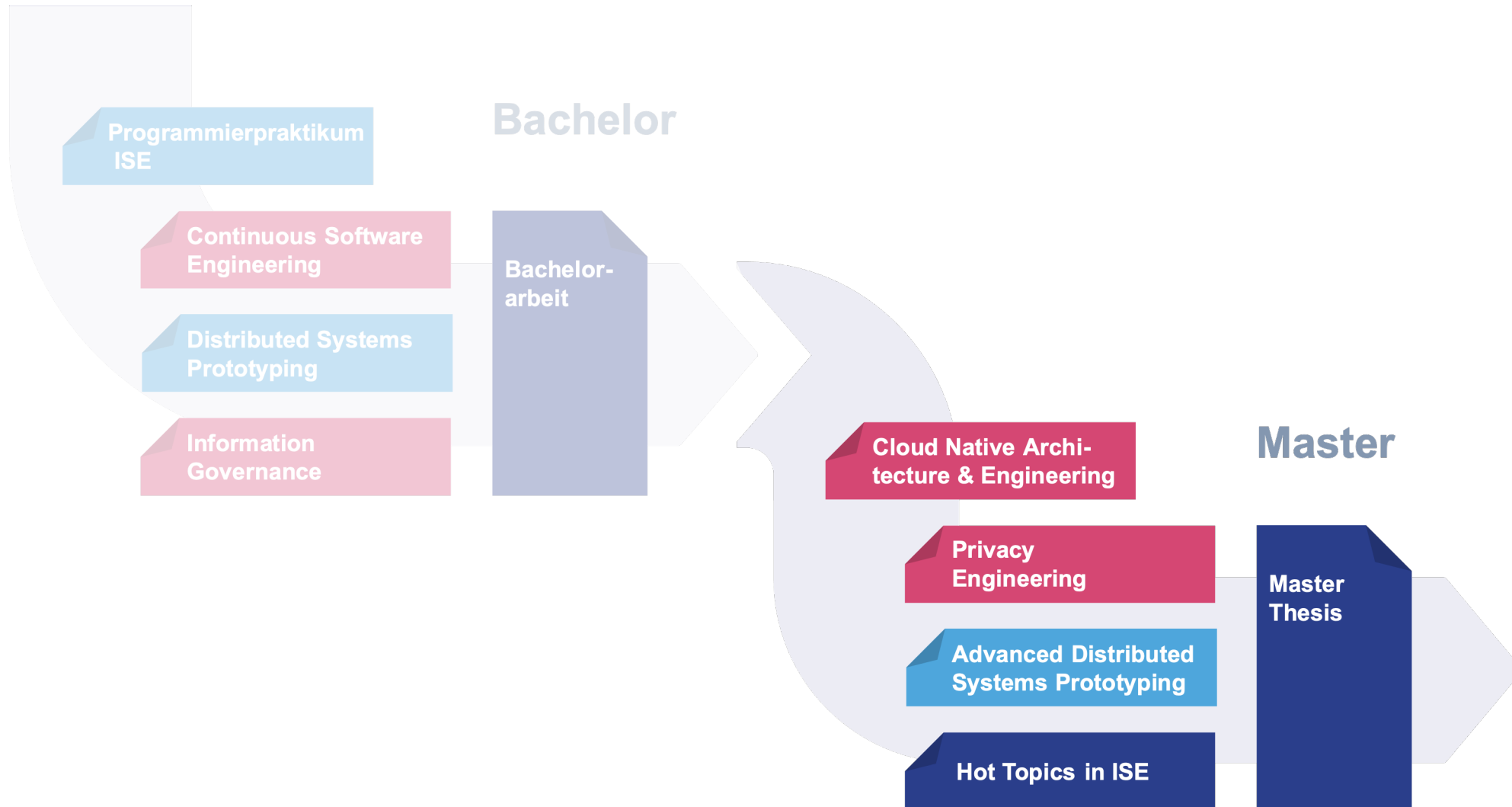
### **Final Report:**

- 6-8 Pages incl. references
- Format: IEEE Double Column
- Report can reuse parts of the design document (not more than 2 pages reuse)
- Also provide measurement results etc.
- Brief description of who contributed what

→ Upload via ISIS



# Whats Next?



# Master Thesis @ISE

If you are interested in our topics and want to deepen your knowledge of Cloud Native Techniques (or in the areas of Blockchain and Privacy Engineering), consider writing a thesis with us!

"Validating ZoKrates: A Systematic Study of ZKP Applications and ZKP Applicability"

BSc, supervised by [Jonathan Heiß](#)

"Design, Implementation and Evaluation of Zero Knowledge Rollups Using the ZoKrates Toolbox"

MSc, supervised by [Jonathan Heiß](#)

"Monitoring cloud infrastructure services for regulatory transparency"

MSc, supervised by [Elias Grünewald](#)

"Discovery of Personal Data Flows in Microservice Architectures with Tail-Based Distributed Tracing"

MSc, supervised by [Elias Grünewald](#) and [Maria Borges](#)

"Detecting PII in Conversational Agents Using Cloud-Based NLP Services"

BSc, supervised by [Nicola Leschke](#) and [Sebastian Werner](#)

"Privacy-aware microservice deployments"

MSc, supervised by [Elias Grünewald](#)

"Privacy-Preserving Process Mining for Highly Variable Process Paths"

MSc, supervised by [Dr.-Ing. Frank Pallas](#)

"Graph-based Clustering of Data Subject Access Request Data"

BSc, supervised by [Dr.-Ing. Frank Pallas](#) and [Nicola Leschke](#)

"Nightlines: Privacy Preserving IOU Tokens"

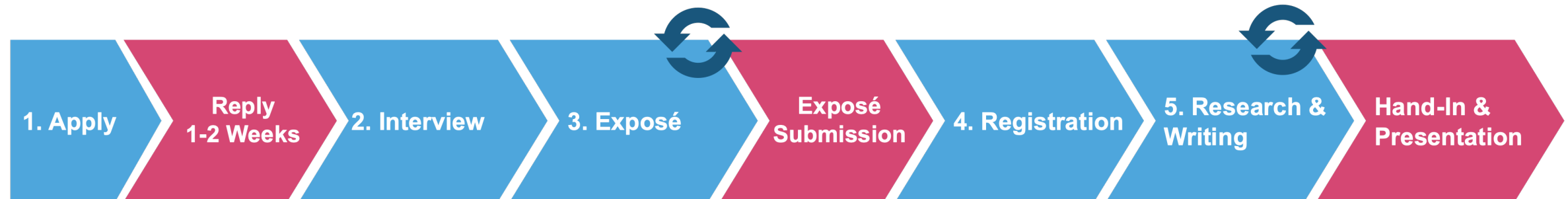
MSc, supervised by [Jacob Eberhardt](#)

"Sizing Functions in Serverless Applications Using Machine Learning"

MSc, supervised by [Jörn Kuhlenkamp](#)

"Using Dark Launches in Serverless Environments"

MSc, supervised by [Sebastian Werner](#)



Visit: <https://www.tu.berlin/en/ise/study-teaching/theses> for more information.

## And After That?!

We are always looking for research assistants (d/m/w) to **join our team** and **conduct innovative research** in one or several of our research areas (**Cloud**, Blockchain, Privacy).

Several **fully funded** positions for a **doctorate** (100% TV-L E13) are available.

<https://www.tu.berlin/en/ise/jobs>



# Schedule

